

REMARKS AND AMENDMENTS

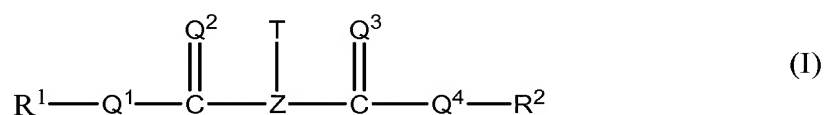
Claims 5, 6, and 12 have been amended as discussed above.

Claims 1 and 13 have been amended by deleting without prejudice the component defined by the phrase “an inorganic acid containing about 2 or more acidic hydrogens”.

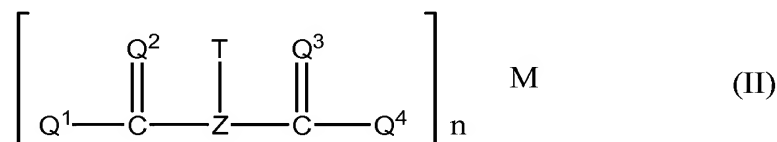
Claims 1 and 13 have been amended by the definition of the non-polymeric hydrocarbyl substituted dicarbonyl derivative from claim 4. In addition the definition of Z specifies that Z is 2 to about 8 carbon atoms. Support for the definition of Z is disclosed on page 9, lines 18-19 of the specification. T is defined as a hydrocarbyl group, or mixtures thereof. Support for the definition of T is found in original claim 4, and on page 10, line 4 which specifies a preference for T to be a hydrocarbyl group.

The relevant portion of the claims 1 and 13 relating to the non-polymeric hydrocarbyl substituted dicarbonyl derivative is now defined as:

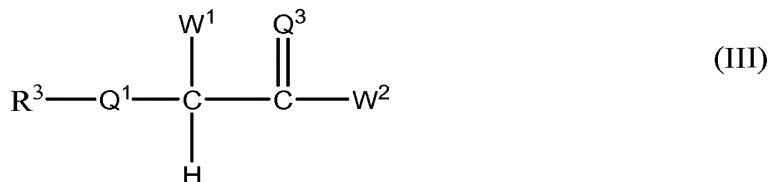
“(1) a non-polymeric hydrocarbyl substituted dicarbonyl derivative selected from the group consisting of an acid, an ester, a salt, an anhydride, ester-acid, acid-salt and mixtures thereof, wherein the non-polymeric hydrocarbyl substituted dicarbonyl derivative is derived from the formulae:



or



or



wherein,

T is a hydrocarbyl group or mixtures thereof;

Z is 2 to about 8, carbon atoms;

Q¹, Q², Q³, Q⁴ and Q⁵ are all independently oxygen or sulphur;

R¹, R², R³ and R⁴ are independently hydrogen or a hydrocarbyl group;

W¹ is Q⁵-R⁴;

W² is a hydrogen, Q⁴-R² or mixtures thereof;

M is a valence of a metal ion, an ammonium ion or mixtures thereof; and

n is an integer equal to or less than the available valence of M”.

Applicants submit that the amendments to the claims indicated above do not add subject-matter and are fully supported by the specification.

Claims 2, 3, 4, 9, and 15 have been cancelled without prejudice.

The Examiner has rejected claims 1-4, 6 and 9 under 35 U.S.C. 102(b) in view of Olson (US 5,308,514).

The Examiner contends that Olson discloses a grease composition comprising an overbased calcium sulphonate containing solid particles of colloiddally dispersed calcium carbonate in the form of calcite. Olson further discloses the grease composition containing a lubricating oil and a salt forming acid. Acids such as orthophosphoric acid, overlap with the definition of the inorganic acid of the present invention. Further Olson discloses organic acids such as malonic acid or succinic acid (column 4, lines 20-26).

Applicants submit that the amendment to claims 1 and 13 obviate the Examiner's 102(b) rejection because the non-polymeric hydrocarbyl substituted dicarbonyl derivative has T defined as a hydrocarbyl group and Z having 2 to about 8 carbon atoms. Since T is a hydrocarbyl group, the compounds defined by Formulae (I) and (II) do not overlap with the definitions of the acids disclosed by Olson. Applicants request the Examiner to withdraw the 35 U.S.C. 102(b) rejection in view of Olson.

The Examiner has further rejected claim 10 under 35 U.S.C. 102(b) in view of Olson in combination with evidence given by Muir (US 4,560,489). In view of the amendment discussed above relating to Olson, Applicants submit that this rejection has

been obviated. Therefore Applicants request the Examiner to withdraw the 35 U.S.C. 102(b) rejection in view of Olson in combination with the evidence of Muir.

The Examiner has rejected claims 13-14 under 35 U.S.C. 103(a) as being unpatentable over Olson. Applicants respectfully traverse.

With regard to obviousness, Applicants submit that in view of the technical differences highlighted above between the present invention and Olson, the present invention is unobvious over Olson. Olson discloses the acids defined in column 4, lines 20-26 as suitable for forming complex greases (see column 4, line 20). In contrast, Applicants claimed acid producing compounds are not taught, suggested or disclosed by Olson in column 4, lines 20-26 as providing water wash-off and/or water wash-off performance. The present invention has unexpectedly discovered that a grease prepared in the presence of at least one acid producing compound or derivatives thereof as defined by claims 13-14 and (also claim 1) is capable of imparting decreased water wash-off and/or imparting decreased water wash-off. Thus Applicant's submit that claims 13-14 (and also claim 1) of the present invention are unobvious over Olson. The Examiner is requested to withdraw the 35 U.S.C. 103(a) rejection in view of Olson, and find all claims allowable.

The Examiner has further rejected claims 7, 8, and 11 under 35 U.S.C. 103(a) in view of Olson and Ney (US 5,932,525). Applicants submit that no obviousness arguments are necessary because the present invention has been amended by the requirements of claim 4. Since the Examiner has not rejected claim 4 in view of Olson and Ney, claim 4 is allowable in view of the combination of Olson and Ney.

The Examiner has further rejected claim 12 under 35 U.S.C. 103(a) in view of Olson, Muir and Ney. Applicants submit that the present invention is unobvious in view of the requirements of claim 4 that have been added into independent claims 1 and 13. Since the Examiner has not rejected claim 4 in view of Olson, Muir and Ney, claim 4 is allowable in view of the combination of Olson, Muir and Ney.

The Examiner has further rejected claim 5 under 35 U.S.C. 103(a) in view of Olson and Hayashi. Since original claim 5 is dependent on original claim 4, the same

objection to claim is also discussed below in relation to the subject-matter of both claims 4 and 5.

The Examiner contends that Olson does not disclose succinic acid as being substituted with a hydrocarbyl group. However, Hayashi discloses a grease composition comprised of hydrocarbyl substituted succinic acid (column 17, line 55 to column 18, line 3, also column 22, lines 10-24, column 22, line 68 to column 23, line 5).

Hayashi discloses a lubricating composition containing an oil soluble reaction product of an acylated reaction product, a polyamine and a mono-functional acid. The oil soluble reaction product is suitable for improving viscosity and dispersancy of lubricating oils. Thus a person skilled in the art would contemplate employing in a lubricating oil a compound capable of improving viscosity and dispersancy.

In contrast, Applicants submit that this is not the case for a grease. A grease is not a thick oil, but instead a grease is a thickened oil consisting of at least two well defined components (i) a thickener (may also be referred to as a gelling agent), and (ii) a fluid lubricant. Consequently a grease matrix is held together by internal binding forces utilising the thickener to provide to the grease a solid character that is capable of resisting positional change. The information above is confirmed in excerpts from the attached standard textbook (see pages 306 to 308 of “Chemistry and Technology of Lubricants”). In addition, thickening agents for grease are disclosed on pages 313 to 316 of the attached standard textbook “Chemistry and Technology of Lubricants”. Disclosed on pages 313 to 316 are a wide variety of thickening agents known to a person skilled in the art of preparing grease. It is the presence of the thickener that is believed to provide the grease matrix structure that results in a thickened oil (as defined by the present invention by the term grease) instead of a thick oil (as considered to be a lubricating composition of Hayashi).

In addition, the oil soluble reaction product of Hayashi has an amino functionality (see Title, Abstract, Field of Invention, all of the examples, column 3, lines 63, column 3, lines 65 to 68). In contrast the acid producing compound of the present invention is defined (in claim 1 and 13) as being “an acid, an ester, a salt, an anhydride, ester-acid, acid-salt and mixtures thereof.” Thus the present invention has

unexpectedly discovered that the acid producing compound of the present invention provides a grease with poor water wash-off or water repellency.

If a person skilled in the art combined Olson with Hayashi, the resultant combination would produce a grease containing an oil soluble reaction product with an amino functionality. In contrast the present invention contains an acid producing compound with functionality selected from an acid, an ester, a salt, an anhydride, ester-acid, acid-salt and mixtures thereof. Since neither Olson nor Hayashi teach, suggest or disclose the acid producing compound of the present invention, Applicants submit that the present invention is non-obvious over Olson and Hayashi. Applicants request the Examiner to withdraw the rejection under 35 U.S.C. 103(a) in view of Olson and Hayashi.

If for any reason the Examiner believes that a telephone conference would expedite the prosecution of this application, I can be reached at the telephone number listed below.

The Commissioner is authorized to charge any required fees or credit any overpayment of fees to The Lubrizol Corporation Deposit Account No. 12-2275.

Respectfully submitted,

THE LUBRIZOL CORPORATION

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